

W. 20°. On the 15th two centers are recognizable, one in N. 53°, W. 20° and the other in N. 59°, W. 10°, while at the same time a third center was forming in an apparently independent manner at about N. 35°, W. 25°. The northernmost of these three whirls moved northeastward over Scotland and then stretching eastward combined with *B* to form a depression that was central on the 17th over the southern Baltic and on the 18th in western Russia.

F. This is the center just referred to on the 15th near the Azores, it moved over those islands on the 16th, 17th, and 18th in a northwesterly direction, and at noon of the 18th was central about N. 40°, W. 30°, after which it recurred to the north and northeast and disappeared on the 20th.

G. This first appears as a depression north of Scotland on the 18th, and north of Norway on the 19th, after which it moved east and southeast toward eastern Russia, while a high pressure area was central over France, Germany, and Austria.

H. While pressure still remained high in Europe a depression appears on the 21st east of Iceland, which on the 22d is represented by a small depression in southern Sweden and another north of Norway. By noon of the 23d these had developed into a deep low pressure in Lapland, which moved southeastward beyond our maps.

I. The area of highest pressure in central Europe appears on the 23d as the eastward extension of the still higher pressure central west of Ireland at about N. 50°, W. 15°. To the north of this an extensive depression soon developed, which on the 24th may be located at N. 65°, W. 5°. This continued moving southeastward, and on the 26th, at noon, was central in the middle portions of Norway and Sweden. On the 29th, at noon, it was in northern Norway and Sweden, where it is also located on the 30th, at noon, with the subsidiary whirls forming near Ireland and Portugal. On the 31st it had moved southeastward towards eastern Russia.

J. On the 19th pressure seems to have been somewhat low over the Caribbean Sea, while it was quite high over the eastern part of the United States and the adjoining Atlantic Ocean. No reports of whirlwind storms or high winds have as yet been received, but a complete system of cyclonic winds existed over the Caribbean Sea, whose center on the 20th was approximately at N. 18° and W. 82°. On the 21st it was at N. 24°, W. 78°; on the 22d, at noon, the wind circulated

about a center at N. 30°, W. 79°, and at this time begins a definite history of United States storm XV, which broke up on the 23d in Maryland.

OCEAN ICE IN OCTOBER.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for October during the last 11 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
October, 1883.....	46 56	46 22	October, 1883.....	46 56	42 22
October, 1884.....	Off Cape Race.		October, 1884.....	46 56	50 55
October, 1885.....	48 21	47 12	October, 1885.....	48 21	47 12
October, 1886.....	41 34	49 43	October, 1886.....	46 03	46 37
October, 1887.....	42 58	50 02	October, 1887.....	42 58	50 02
October, 1888.....	51 43	55 36	October, 1888.....	51 43	55 36
October, 1889.....	44 32	49 26	October, 1889.....	46 30	45 59
October, 1890.....	44 47	49 33	October, 1890.....	47 56	45 45
October, 1891.....	48 04	48 27	October, 1891.....	48 04	48 27
October, 1892.....	Straits of Belle Isle		October, 1892.....	52 34	51 00
October, 1893.....	49 57	59 32	October, 1893.....	52 47	51 16
Mean.....	46 32	50 39	Mean.....	48 15	48 41

Ice was reported south of the 50th parallel only on two dates, 8th and 11th. In an area extending from the Straits of Belle Isle to the 51st meridian ice was reported on the 1st to the 4th, 7th, 8th, 10th, 11th, 13th to 15th, 17th, 22d, 26th, 28th to 31st. The southern limit of ice was about 3½° north and the eastern limit was about 2½° west of the average southern and eastern limits of ice for October. The region within which icebergs or field ice were reported for the current month is shown on Chart I by crosses (X).

OCEAN FOG IN OCTOBER.

The limits of fog belts west of the 40th meridian, as determined by reports of shipmasters, are shown on Chart I by dotted shading. Near the Grand Banks of Newfoundland fog was reported on 19 dates; between the 55th and 65th meridians, on 12 dates; and west of the 65th meridian, on 6 dates. Compared with the corresponding month of the last 6 years the dates of occurrence of fog near the Grand Banks numbered 5 more than the average; between the 55th and 65th meridians, 8 more than the average; and west of the 65th meridian, 3 more than the average.

TEMPERATURE OF THE AIR (expressed in degrees Fahrenheit).

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are, however, not drawn for the higher irregular surface of the Rocky Mountain plateau; the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country over which they are drawn; in mountainous regions such isotherms would be controlled largely by the topography, and it is, therefore, not practicable to present the temperature data in this manner unless a contour map on a large scale is published as a base chart.

In the table of meteorological data from voluntary observers the actual mean temperature is given for each station, and in the tables of climatological data for the regular stations of the Weather Bureau both the mean temperatures and the departures from the normal are given. In the latter table the stations are grouped by geographical districts, for each of which is given the average temperature and departure from the normal. The normal for any district or station may be found by adding the departures to the current average when the latter is below the normal and by subtracting when it is above.

For regular stations of the Weather Bureau the monthly mean temperature is the simple mean of all daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to the table of meteorological data.

During October, 1893, the mean temperature was highest at a few stations in the extreme southern portion of Florida and in the Colorado Valley, the average being between 75 and 80. The temperature averaged between 50 and 55 on the immediate coast of Washington, Oregon, and California north of the 35th parallel; corresponding mean temperatures occurred on the Atlantic coast from Cape Breton to Long Island Sound. The average temperature was below 32 in central Manitoba and Saskatchewan.

DEPARTURES FROM NORMAL TEMPERATURE.

As compared with the normal for this month the mean temperature for October, 1893, was in excess over the lower Missouri and upper Mississippi valleys, the Lake region, the Middle States, New England, and the Canadian Maritime Provinces; the maximum excess was from 4 to 7 in the lower Saint Lawrence valley, New Brunswick, and Cape Breton.

The temperature was below the normal in the extreme north-west and throughout the Pacific States, the maximum deficit being about 4.5 in central Oregon and Washington, and 4.0 in Assiniboia and Manitoba. The temperature was also below the normal in the south Atlantic and Gulf states, although it was about normal at Key West and in South Carolina; the maximum deficit was about 3.1 at Little Rock, Ark.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for October for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for October, 1893; (4) the departure of the current month from the normal; (5) the extreme monthly mean for October during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of Oct.	(2) Length of record.	(3) Mean for Oct., 1893.	(4) Departure from normal.	(5) Extreme monthly means for October.			
					Highest.	Year.	Lowest.	Year.
<i>Arizona.</i>	0	Years	0	0	0		0	
Fort Apache	55.9	21	53.7	- 2.2	60.0	1875	50.6	1883
Fort Mohave	72.0	21	70.8	- 2.1	80.0	1875	68.5	1886
Whipple Barracks	55.0	22	50.8	- 4.2	62.2	1875	49.9	1883
<i>Arkansas.</i>								
Keesees Ferry	60.2	11	57.8	- 2.4	64.0	1881	56.0	1885
<i>California.</i>								
Riverside	63.8	11	.....	.....	67.2	1885	60.7	1886
<i>Colorado.</i>								
Las Animas	52.7	10	54.9	+ 2.2	57.1	1889	49.4	1883
<i>Florida.</i>								
Merritts Island	75.3	11	76.0	+ 0.7	79.0	1882	72.9	1891
<i>Georgia.</i>								
Forsyth	67.0	19	67.6	+ 0.6	75.4	1884	61.7	1885
<i>Idaho.</i>								
Boise Barracks	50.1	19	47.2	- 2.9	56.9	1872	44.5	1883
Fort Sherman	46.7	10	45.0	- 1.7	50.8	1889	41.2	1883
<i>Indiana.</i>								
Lafayette	52.8	11	54.3	+ 1.5	56.4	1881	47.9	1889
<i>Iowa.</i>								
Oresco	46.0	21	48.2	+ 2.2	54.1	1879	41.2	1873
<i>Kansas.</i>								
Eureka Ranch	55.6	10	53.6	- 2.0	62.9	1886	51.0	1883
Independence	58.5	21	61.8	+ 3.3	63.0	1881	52.2	1873
<i>Louisiana.</i>								
Grand Coteau	68.1	12	65.0	- 3.1	75.5	1883	63.4	1891
<i>Maine.</i>								
Orono	45.6	22	47.9	+ 2.3	49.7	1879	42.1	1888
<i>Maryland.</i>								
Cumberland	53.1	22	54.0	+ 0.9	60.0	1881	48.0	1888
<i>Michigan.</i>								
Kalamazoo	50.1	17	52.4	+ 2.3	54.5	1879	45.7	1887
<i>Missouri.</i>								
Sedalia	57.2	11	58.5	+ 1.3	61.4	1886	51.3	1883
<i>Montana.</i>								
Fort Custer	47.7	14	47.2	- 0.5	55.0	1891	42.2	1883
<i>Nebraska.</i>								
Fort Robinson	48.8	10	48.3	- 0.5	53.6	1884	41.4	1883
Genoa (near)	49.5	17	50.6	+ 1.1	55.9	1886	45.0	1883
<i>Nevada.</i>								
Browns	54.4	21	.....	.....	61.7	1875	46.4	1882
Carson City	48.8	16	47.8	- 1.0	55.1	1875	44.0	1883
<i>New Hampshire.</i>								
Hanover	45.0	22	49.1	+ 4.1	52.4	1879	40.5	1888
<i>New Mexico.</i>								
Deming	66.3	11	70.3	+ 4.0	72.4	1885	60.5	1892
Fort Wingate	52.4	22	52.7	+ 0.3	57.8	1875	47.2	1871
<i>New York.</i>								
Cooperstown	46.4	22	48.0	+ 1.6	53.3	1879	41.5	1888
Plattsburg Barracks	47.1	22	49.0	+ 1.9	53.6	1879	42.1	1888
<i>North Carolina.</i>								
Lenoir	56.3	22	56.6	+ 0.3	66.4	1878	48.0	1874
<i>Oklahoma.</i>								
Fort Reno	60.9	9	61.5	+ 0.6	65.6	1888	57.1	1887
Fort Sill	62.1	21	61.2	- 0.9	70.0	1874	57.7	1885
Fort Supply	58.6	13	57.0	- 1.6	62.2	1874	54.4	1885
<i>Oregon.</i>								
Bandon	52.1	9	50.7	- 1.4	55.2	1889	47.0	1886
<i>Pennsylvania.</i>								
Dyberry	46.3	20	48.1	+ 1.8	53.4	1879	41.3	1888
Grampian	47.6	22	49.5	+ 1.9	56.4	1879	43.4	1888
Wellsboro	48.2	13	46.0	- 2.2	54.2	1881	41.2	1889
<i>South Carolina.</i>								
Statesburg	62.9	12	62.3	- 0.6	69.0	1881	58.7	1891
<i>South Dakota.</i>								
Fort Sully	49.0	22	49.0	0.0	56.0	1879	42.1	1873
<i>Texas.</i>								
Austin	67.6	21	70.2	+ 2.6	73.6	1883	63.0	1873
Silver Falls	62.2	7	63.0	+ 0.8	64.4	1830	59.7	1887
<i>Utah.</i>								
Terrace	52.5	17	49.5	- 3.0	67.1	1887	45.8	1878
<i>Vermont.</i>								
Stratford	46.6	20	48.4	+ 1.8	52.8	1879	40.6	1888

Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of Oct.	(2) Length of record.	(3) Mean for Oct., 1893.	(4) Departure from normal.	(5) Extreme monthly means for October.			
					Highest.	Year.	Lowest.	Year.
<i>Virginia.</i>	0	Years	0	0	0		0	
Dale Enterprise	56.4	13	57.2	+ 0.8	61.3	1886	48.2	1890
<i>Washington.</i>								
Fort Townsend	50.6	17	46.4	- 4.2	54.6	1875	46.4	1893
<i>West Virginia.</i>								
Parkersburg	57.6	12	54.7	- 2.9	.....	.....	49.0	1888
<i>Wisconsin.</i>								
Madison	48.9	22	50.1	+ 1.2	58.2	1879	44.1	1887
<i>Wyoming.</i>								
Fort Washakie	43.6	10	43.6	0.0	47.2	1889	39.9	1881

TEMPERATURE, JANUARY TO OCTOBER, 1893.

For the period, January 1st to October 31st, the average temperature was about normal in the east and west Gulf states. It was below the normal by about 1.5 or less in New England, the middle Atlantic and south Atlantic states, southern Florida, the Ohio Valley and Tennessee, the lower lake region, the upper lake region, the upper Mississippi and Missouri valleys, the northern and middle slopes of the Rocky Mountains, the southern plateau, and the south Pacific coast region; it was also below the normal by 2 or 3 in the middle and northern plateau regions and the middle and north Pacific coast states. The mean temperature for this period was below the normal by 1.7 on the southern Rocky Mountain slope and 0.8 in the extreme northwest.

YEARS OF HIGHEST MEAN TEMPERATURE FOR OCTOBER.

The mean temperature for October, 1893, was the highest on record at the following stations, for which also the corresponding departures from the normal temperatures for October are given: Manchester, N. H., +3.4; Northfield, Vt., +3.5; Vineyard Haven, Mass., +3.3; Nantucket, Mass., +0.4; and Abilene, Tex., +1.9.

The highest mean temperature for October was noted from the north Pacific coast to the northeast slope of the Rocky Mountains in 1889; on the middle Pacific coast in 1887; in the east Gulf states in 1884; in the middle Gulf states in 1883; along the Atlantic states south of Pennsylvania in 1881; and from the lower Missouri and upper Mississippi valleys over the Ohio Valley, the Lake region, New York, and New England in 1879.

YEARS OF LOWEST MEAN TEMPERATURE FOR OCTOBER.

The mean temperature for October, 1893, was the lowest on record at the following stations, and the corresponding departures were as follows:

Fresno, Cal., -5.2; Eureka, Cal., -0.7; Walla Walla, Wash., -4.9; Portland, Oregon, -4.5; Fort Canby, Wash., -3.1; Tatoosh Island, Wash., -2.7.

The lowest mean temperature for October was noted generally over New York and New England in 1888; in the upper Mississippi and Red River of the North valleys and in Texas in 1887; along the south Pacific coast in 1886; from eastern Kansas to the middle Gulf coast in 1885; over the middle plateau region in 1883; from the Pacific coast between the 35th and 45th parallels to the northeast slope of the Rocky Mountains in 1881; in the Atlantic coast states south of New York in 1876; and in the middle Mississippi, lower Ohio, and lower Missouri valleys in 1873.

MAXIMUM TEMPERATURE.

The highest temperature reported for October by a regular station of the Weather Bureau was 98 on the 8th at Yuma, Ariz.; the other cases of maxima exceeding 90 were: Los Angeles, Cal., 91 on the 12th; Tucson, Ariz., 92 on the 8th; Dodge City, Kans., 91 on the 8th; Wichita, Kans., 91 on the

9th; Concordia, Kans., 91 on the 8th; Abilene, Tex., 94 on the 8th; San Antonio, Tex., 97 on the 1st; Palestine, Tex., 97 on the 1st; Hannibal, Mo., 93 on the 1st; Titusville, Fla., 91 on the 4th. The lowest maxima were 65 at Eastport, Me., on the 6th; 63 at Escanaba, Mich., on the 10th; 64 at Saint Vincent, Minn., on the 8th; 62 at Spokane, Wash., on the 15th; 55 at Tatoosh Island, Wash., on the 2d; 59 at Port Angeles, Wash., on the 4th.

MINIMUM TEMPERATURE.

Minimum temperatures of less than 15 were reported as follows: 14 at Northfield, Vt., on the 31st; 12 at Huron, S. Dak., on the 28th; 12 at Moorhead, Minn., on the 29th; 10 at Saint Vincent, Minn., on the 29th; 13 at Havre, Mont., on the 23d; 14 at Valentine, Nebr., on the 28th.

Minimum temperatures of 60 or more were reported as follows: 60, on the 14th, at Titusville, Fla.; 64, on the 31st, at Jupiter, Fla.; 68, on the 19th, at Key West, Fla.

DAILY AND MONTHLY RANGES OF TEMPERATURE.

The greatest daily range of temperature is given for each station in the table of climatological data for Weather Bureau stations. The extreme monthly ranges of 60 or over have been confined to South Dakota, Kansas, Iowa, the southern portions of North Dakota and Minnesota, the eastern portion of Colorado, and the northern portions of Kansas and Missouri; the maximum monthly range was 70 at North Platte, Nebr. The smallest monthly ranges have been 20 at Key West, Fla.; 26 at Jupiter, Fla.; 27 at Galveston, Tex.; 26 at Tatoosh Island, Wash.; and 27 at Fort Canby, Wash.

LIMITS OF FREEZING TEMPERATURE.

The southern limit of the region within which the air has had a freezing temperature at some time during the month is approximately shown by the lines on Chart VI joining the places at which minimum temperatures of 32 and of 40 occurred within the instrument shelters of the Weather Bureau; the latter minimum is usually accompanied by a more or less severe frost on the ground outside of the shelter. During October, 1893, the line of minimum 40 extended from Norfolk along the immediate coast to Savannah, thence inward through southern Alabama, Mississippi, and Louisiana to Shreveport, La., and central Texas. On the Pacific coast it extended from southern Arizona to southern California and up the western coast to N. 40°. The actual reports of frosts, as given in the next paragraph of this REVIEW, can be compared with the location of this line.

FROST.

The reports of frosts injurious to vegetation are as follows: 2d, Table Rock, Colo., potatoes injured. 6th and 11th, Moab, Utah, tomato vines damaged. 15th, Oxanna, Ala., vegetables killed; Meridian, Miss., vegetables killed, and slight damage to cotton in some places on high lands; Shreveport, La., sweet potato vines killed; Bee Branch, Ark., potato vines killed; Keesees Ferry, Ark., vegetation killed; Nunnely, Tenn., tender vegetation killed; Eight Mile, Mo., vines and plants killed. 16th, Montgomery, Ala., tender plants and vegetation slightly injured; Greeneville, Tenn., tender vegetation killed on lowlands; Nashville, Tenn., tender vegetation and some corn killed. 17th, Albany, N. Y., tender vegetation killed; Lynnville, Tenn., vegetation killed on low ground; Lodi, Cal., tender plants killed and potato and tomato vines injured. 18th, Cambridge, Ind., tender plants killed. 23d, Port Angeles, Wash., potato and tomato vines killed; Springbrook, Oregon, vegetables killed on low lands. 27th, Abilene, Tex., vegetables and cotton killed; Mesquite, Tex., cotton killed on low lands; Carrollton, Mo., vegetation killed. 28th-31st, South Fork, Ky., late corn and garden vegetation damaged. 29th, Newbern, Ala., corn killed on bottom lands; Nashville, Tenn., vegetation killed; Laconia, Ind., vegetation

killed; Lancaster, Wis., late vegetation killed. 30th, Providence, R. I., plants killed; Society Hill, S. C., tender vegetation killed, and some damage to corn; Little Rock, Ark., tender plants killed. 31st, Charlotte, N. C., tender vegetation killed; Pinopolis, S. C., vegetation killed; 15 miles from Augusta, Ga., cotton and potato vines killed; Athens, Ga., cotton killed; Montgomery, Ala., tender plants and vegetables damaged.

The following table shows the dates of the occurrence of the first light frost, the first heavy frost, and the first snow-fall at the respective stations:

Dates of first light and heavy frosts and snow, October, 1893.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Alabama.				California—Continued.			
Alco.....	30			Lodi.....		17	
Bermuda.....	29			Mokelumne Hill.....	16		
Birmingham.....	16			Orangevale.....	12	17	
Brewton.....	14	29		Palermo.....	17		
Carrollton.....	29	31		Placerville.....		30	
Citronelle.....	16			Redding.....		16	
Clanton.....	15	28		Sacramento.....	17		
Cordova.....	15			San Jacinto.....	30		
Decatur.....	22			San Jose.....		11	
Elba.....	15			Santa Cruz.....	17		
Evergreen.....	31			Tulare.....	11		
Florence.....	15	16		Turlock.....		17	
Greensboro.....	15			Upper Lake.....	16		
Lynn.....		15		Susanville.....			15
Maple Grove.....	15	30		Vacaville.....	16		
Mobile.....	31			Wheatland.....	11		
Montgomery.....	16	31		Yuba City.....	17		
Mount Willing.....	29	30		Colorado.			
Newbern.....	15	29		Akron.....			7
Newberg.....		16		Boulder.....		6	1
Opelika.....	15	28		Ryers.....			1
Oxanna.....	15			Canyon.....		19	
Pushmataha.....	15	31		Cheyenne Wells.....		2	
Rock Mills.....	15	16		Colorado Springs.....		2	1
Selma.....	15	31		Deer Trail.....		2	1
Scottsboro.....	15	30		Denver.....		26	1
Starlington.....	15			Downing.....		2	5
Talladega.....	15	31		Dumont.....		18	22
Tallassee.....	15	31		First View.....		1	11
Thomasville.....	16			Glen Eyrie.....			1
Tuscaloosa.....	16	31		Gold Hill.....		1	
Tuscumbia.....	15			Grand Junction.....		26	
Union Springs.....		14		Hugo.....			1
Wilsonville.....		30		Husted.....		2	1
Arizona.				Kit Carson.....		23	
Calabasas.....		1		La Jara.....			27
Crittenden.....		23		Lamar.....		2	
Dudleyville.....	3			Las Animas.....		2	
Flagstaff.....			22	Lay.....			2
Holbrook.....	2			Le Roy.....			11
Lochiel.....		1		Minneapolis.....		4	
Payson.....	1	2		Parachute.....		3	
Saint Helenas Ranch.....	24			Pueblo.....		2	
Show Low.....		1		Red Cliff.....			1
Wilgus.....	2	3		River Bend.....		2	10
Arkansas.				Saint Cloud.....		16	
Ashdown.....	15			Sanborn.....		21	
Bee Branch.....	4	15		San Luis.....			25
Brinkley.....	15	29		Seibert.....			11
Camden.....	15	22		Stamford.....			1
Conway.....	15			Table Rock.....		2	
Corning.....		15		Thon.....			1
Dallas.....	15			Vilas.....		26	
Fayetteville.....		15		Watkins.....			10
Forrest.....	15			Zuck.....		2	
Fort Smith.....		15		Connecticut.			
Hamburg.....		15		Bridgeport.....		17	
Keesees Ferry.....		15		Canton.....			30
Kirby.....	15			Greenfield Hill.....			
Lonoke.....		15		Hartford.....			
Little Rock.....	13	30		Lebanon.....			
Malvern.....	4			Middletown.....			
Marcella.....	22	26		New Hartford.....			
New Gascony.....		15		New Haven.....			
Newport.....		15		New London.....		3	
O'ceola.....	15	29		Norwalk.....		17	30
Ozark.....	15			South Manchester.....			
Prescott.....	16			Stevenson.....		26	
Rison.....		15		Storrs.....			
Russellville.....	15			Thompson.....		17	
Searcy.....	14	16		Voluntown.....			
Stuttgart.....	15			Delaware.			
Washington.....	14	15		Dover.....		17	
California.				Millford.....		29	
Arcaata.....		17		Millboro.....			
Cloverdale.....	17			Seaford.....		17	
Edmanton.....		16		District of Columbia.			
Eureka.....	17			Washington.....			17
Evergreen.....	18			Florida.			
Florin.....	11	16		Moseley Hall.....		30	
Fresno (near).....		11		Georgia.			
Gridley.....	11			Adairsville.....			15
Iowa Hill.....	16			Albany.....			31
Jolon.....	10			Americus.....		15	31

Dates of first light and heavy frosts and snow—Continued.

First frost.			Snow.	First frost.		
State and station.	Light.	Heavy.		State and station.	Light.	Heavy.
Georgia—Continued.				Kansas—Continued.		
Athens	15	31		Columbus	14	15
Atlanta	15	16		Concordia	14	14
Augusta	15	31		Cunningham	14	29
Brag	15	31		Dodge City	3	12
Camak	16	31		Eldorado	13	24
Camilla	15	31		Elk City	3	
Cebutta	15	15		Emporia	15	15
Covington	15	31		Engelwood	12	25
Dahlonega	15	29		Garden City	3	
Jublin	15	31		Grainfield	3	12
Elberton	14	30		Grenola	3	15
Fleming	31	31		Hutchinson	13	27
Forsyth	15	31		Independence	3	15
Griffin	15	30		Kiowa	3	27
Hephzibah	30	31		Leavenworth		3
Homerville	15	31		Lebo	15	15
Lafayette	15	30		Leoti		2
Lagrange	15	30		Manhattan		3
Livingston	14	30		Mankato		29
Louisville	15	31		Marion	13	15
Macon	16	31		Marmaton	3	15
Marietta	15	31		Medicine Lodge	3	20
Marshallville	15	28		Minneapolis		13
Milledgeville	15	31		Morton	6	28
Millen	16	31		Mount Holly	13	29
Morgan	14	30		Olathe	13	27
Pinola	31	31		Oswego		14
Point Peter	15	31		Pleasant Dale		12
Poulan	16	31		Rome	3	
Reynolds	15	31		Sedan	14	27
Rome	15	16		Sharon Springs		11
Savannah	31	31		Topeka	14	15
Thomasville	16	31		Tribune	2	
West Point	15	31		Utica		12
Whitesburg	15	31		Wakefield	25	29
Idaho.				Wallace		2
Garden Valley			10	Wamego	3	15
Illinois.				Washington		15
Bushnell	15	31		Wichita	13	15
Cairo	15	31		Winona	25	26
Chicago	16	31		Yates Center		3
Dubois	16	31		Kentucky.		
East Peoria	17	31		Bowling Green	15	29
Galva	25	31		Canton		29
Golconda	15	31		Carrollton		28
Greenville	15	31		Cattlettsburg	16	30
Griggsville	15	31		Edmonton		16
Havana	16	31		Eubanks		16
Jordans Grove	30	31		Franklin	15	15
Lagrange	16	31		Greendale		16
Mattoon	29	31		Greensburg	13	30
Olney	15	31		Harrodsburg		16
Oswego	16	31		Louisville		16
Palestine	16	31		Middlesboro		16
Pana	25	31		Mount Sterling		28
Paris	16	31		Pellville	13	29
Peoria	29	31		Russellville		16
Rockford	24	31		Shelby City		16
Sycamore	15	31		South Fork		28
White Hall	15	31		Louisiana.		
Indiana.				Abbeville	13	
Ashboro	16	31		Alexandria	15	
Butler	16	31		Amite	15	
Cambridge City	18	31		Baton Rouge	16	
Connersville	16	31		Cheneyville	15	
Degonia Springs	30	31		Clinton	15	29
Franklin	16	31		Davis	15	
Hawpatch	16	28		Delhi	13	28
Huntingburg	16	31		Emille	15	
Jasper	16	31		Farmersville		15
Jeffersonville	16	31		Girard	15	28
Laconia	29	31		Hammond	15	
Lafayette	16	31		Jeanerette	13	
Madison	29	31		Lafayette	15	
Marengo	16	31		Lake Providence		15
Markle	16	29	29	Liberty Hill	13	15
Mount Vernon	29	31		Maurepas	16	
New Albany	29	31		Melville	29	
Princeton	16	31		Monroe	14	15
Rushville	29	31		New Iberia	16	
Seymour	16	31		Opelousas	15	29
Terre Haute	16	31		Oxford	13	15
Union City	16	31		Paincourtville	30	
Vevay	29	31		Plaquemine	8	
Worthington	16	31		Roseland	15	
Indian Territory.				Schriever	29	
Kemp	13	27		Shreveport	15	
Lehigh	15	27		Thibodeaux	30	
Iowa.				Wallace	30	
Blakeville	29	31		Winnfield	15	16
Davenport	15	31		Wynnsboro	12	
Fort Madison	15	31		Maine.		
Fulton	16	31		Bar Harbor		30
Hopkinton	30	31		Belfast		19
Indianola	14	31		Eastport	17	31
Logan	14	29	29	Gardiner		17
Kansas.				Mayfield		29
Abilene	13	31		Portland	12	17
Allison	13	31		Maryland.		
Altoona	3	25		Bachmans Valley		17
Athol	15	31		Baltimore		17
Cawker City	12	31		Barren Creek Springs		17
Collyer	27	31		Boettcherville		17

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Maryland—Continued.</i>				<i>Minnesota—Continued.</i>			
Cumberland		16		Crookston			23
Darlington		17		Duluth			24
Fallston		17		Fergus Falls			23
Fenby		30		Fort Ripley			23
Frederick		31		Granite Falls			27
Glyndon		17		Lake Winnibigoshish			23
Mount Saint Marys	17	30		Long Prairie			23
New Market		16		Maple Plain			23
Oakland			29	Millan			23
Solomons	17			Montevideo			23
Taneytown	1			New London			23
Woodstock	1	17		Ortonville			23
<i>Massachusetts.</i>				Saint Olof			23
Adams (near)			29	Sank Center			23
Andover		17		Wadena			23
Bedford		16		Willmar			23
Boston		17		<i>Mississippi.</i>			
Chestnut Hill		17		Aberdeen		15	
Concord		17		Agricultural College	15	29	
Dudley		17		Briers		15	
Fall River		17		Brookhaven		15	
Fitchburg		17		Canton		15	
Gilbertville		17		Columbus	15		
Groton	1	27		Crystal Springs	13	15	
Hadley	17			Duck Hill		15	
Hyannis		19		Edwards	15		
Leeds		17		Enterprise	14	30	
Leominster		17		Fayette	15		
Ludlow Center		17		French Camps		15	
Mansfield		17		Greenville	15	16	
Middleboro		17		Hattiesburg	15		
Milton	16	17		Holly Springs	15		
Monroe			29	Ita Bena	15		
Monson	1	17		Jackson		16	
New Bedford		30		Kosciusko	14		
Plymouth		30		Meridian		15	
Provincetown		30		Okalona		31	
Randolph		17		Palo Alto		16	
Roxbury		30		Pearlington	15		
Somerset	11	17		Pontotoc		29	
South Dennis		20		Stonington	15	16	
Taunton		17		University	30		
Vineyard Haven		31		Vaiden		15	
Wakefield		30		Vicksburg	15		
Wellesley		31		Water Valley		30	
Westboro		17		Waynesboro	23		
Winthrop		17		Woodville			
Woods Holl	30			Yazoo City	15	30	
Worcester		17		<i>Missouri.</i>			
<i>Michigan.</i>				Appleton		24	
Albion		16	28	Arthur		15	
Allegan			28	Bethany		25	
Alpena			14	Birch Tree		15	
Bear Lake			28	Bluffton		15	
Bellaire			28	Carrollton		27	
Benton Harbor			1	Carthage		15	
Berlin			27	Columbia		15	
Bronson			28	Conception		7	
Brown City			28	Cowgill		15	
Calumet			26	East Lynne		15	
Charlevoix			28	Edge Hill		9	
Cheboygan			28	Eight Mile		15	
Crystal Falls			28	Eldon		15	
Detroit			28	Farmersville		15	
Evart			28	Fayette		15	
Fitchburg			26	Fox Creek		29	
Gaylord			26	Fulton		14	
Grand Haven			28	Gallatin		28	
Grand Rapids	16			Gayoso		15	
Harrison			28	Glasgow		15	
Harrisville			28	Gordonville		29	
Hastings			28	Half Way		15	
Jeddo		17		Hannibal		24	
Kalamazoo		30	28	Harrisonville		27	
Lansing			28	Hastain		14	
Lathrop			28	Houston		15	
Lodi			28	Humansville		15	
Madison			28	Kidder		15	
Marshall			28	Lamonte		15	
Mottville			28	La Plata		25	
North Marshall			28	Lexington		15	28
Olivet			28	Linn Creek		15	
Paris			28	Marceline		15	
Parkville			28	Marshall		14	
Port Huron			28	Miami		15	
Rawsonville			28	Mine La Motte		15	
Rockland			23	Mount Vernon		27	
Saint Ignace			28	New Boston		26	
Sand Beach		16		New Haven		27	
Stanton			28	New Palestine		24	
Sault Ste. Marie			14	Oak Ridge			
Ypsilanti			28	Olden		29	
<i>Minnesota.</i>				Oregon		15	
Ada			23	Palmyra		15	
Alexandria			23	Panacea		15	
Barrett			23	Platte River			24
Beardsley			23	Saint Louis		25	
Bingham Lake			27	Sarcoux		15	
Bird Island			23	Sedalia		28	
Bloomington			27	Shelbina		15	
Caledonia			28	Springfield		15	
Camden			23	Steelville		15	
Collegeville			23	Stellada		15	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Missouri—Continued.</i>				<i>New York.</i>			
Unionville.....		19	.....	Addison.....		17	28
Van Cleve.....		13	.....	Albany.....		17	28
Vermont.....		15	.....	Alfred Center.....		17	28
Vilas.....		3	.....	Angelica.....		16	28
Warrenton.....		15	.....	Arcade.....		18	28
Wheatland.....		15	.....	Baldwinsville.....		1	29
<i>Nebraska.</i>				Binghamton.....		17	.....
Agee.....		28	.....	Brookport.....		29	.....
Ashland.....		29	.....	Brookfield.....		16	.....
Ashton.....		11	.....	Buffalo.....		29	.....
Bassett.....		11	.....	Cooperstown.....		1	.....
Beaver City.....		12	.....	Eden Center.....		14	.....
Ericson.....		11	.....	Factoryville.....		30	.....
Gering.....		25	.....	Fleming.....		29	.....
Haigler.....		2	.....	Friendship.....		29	.....
Hartington.....		29	.....	Geneva.....		29	.....
Harvard.....		28	.....	Gloversville.....		29	.....
Hay Springs.....		1	.....	Hess Road Station.....		30	.....
Kearney.....		11	.....	Humphrey.....		3	.....
Kimball.....		1	.....	Ithaca.....		1	.....
Lynch.....		28	.....	Jamestown.....		1	.....
Norfolk.....		28	.....	Le Roy.....		26	.....
Omaha.....		28	.....	Lockport.....		26	.....
O'Neill.....		11	.....	Lowville.....		29	.....
Plattsmouth.....		29	.....	Lyons.....		29	.....
Ravenna.....		11	.....	Malone.....		29	.....
Santee Agency.....		28	.....	New York.....	17	30	.....
Stanton.....		12	.....	Ogdensburg.....		17	.....
Sutton.....		11	.....	Oswego.....		17	.....
West Point.....		28	.....	Oxford.....		28	.....
Wilcox.....		11	.....	Palermo.....		29	.....
<i>Nevada.</i>				Perry City.....		17	.....
Austin.....		22	.....	Port Jervis.....		17	.....
Candelaria.....		11	.....	Rochester.....		15	.....
Edgewood.....		10	.....	Romulus.....		17	.....
Gold Hill.....		15	.....	South Canisteo.....		28	.....
Lewers Ranch.....		16	.....	Stillwater.....		31	.....
Pioche.....		17	.....	Wappingers Falls.....		17	30
South Camp.....		15	.....	<i>North Carolina.</i>			
<i>New Hampshire.</i>				Asheville.....	15	16	.....
Bethlehem.....		29	.....	Bailey.....		16	.....
Brookline.....		17	.....	Bakersville.....		16	.....
East Canterbury.....		17	.....	Bryson City.....		14	28
Hanover.....		11	29	Chapel Hill.....		16	29
Littleton.....		26	.....	Charlotte.....		16	31
Manchester.....		17	.....	Columbus.....		16	29
Plymouth.....		17	.....	Douglas.....		15	16
Saunbornton.....		17	.....	Falkland.....		17	30
Stratford.....		29	.....	Fayetteville.....		15	31
<i>New Jersey.</i>				Flat Rock.....		16	.....
Allaire.....	1	16	.....	Goldboro.....		17	.....
Asbury Park.....	17	29	.....	Greensboro.....	29	.....	.....
Atlantic City.....	17	30	.....	Henderson.....		16	30
Bayonne.....		17	.....	Highlands.....		16	.....
Belvidere.....		29	.....	Horse Cove.....		15	16
Beverly.....	17	30	.....	Lenoir.....		15	29
Blairtown.....		17	.....	Lillington.....		15	30
Boonton.....		17	23	Littleton.....		15	29
Bridgeton.....		31	.....	Louisburg.....		15	30
Camden.....	17	30	.....	Lumberton.....		15	.....
Cape May.....		17	.....	Lynn.....		15	29
Charlotteburg.....		17	.....	Marion.....		16	.....
Chester.....		26	.....	May.....		15	30
Egg Harbor City.....		17	.....	Mocksville.....		15	.....
Elizabeth.....		17	.....	Mount Airy.....		16	.....
Franklinville.....		17	.....	Mount Pleasant.....		15	30
Freehold.....		17	.....	Murphy.....		15	.....
Friesburg.....		17	.....	Oak Ridge.....		15	16
Gillette.....		16	.....	Pittsboro.....		16	30
Hightstown.....	17	30	.....	Raleigh.....		17	30
Junction.....		17	.....	Rockingham.....		15	31
Lambertville.....		29	.....	Roxboro.....		16	30
Lancaster.....		30	.....	Rutherford College.....		16	31
Millville.....		17	.....	Salisbury.....		16	30
Moorestown.....		17	.....	Saxon.....		15	29
Newark.....		17	.....	Shelby.....		15	30
New Brunswick.....		17	.....	Sloan.....		15	31
Newton.....		17	.....	Smithfield.....		16	30
Ocean City.....		30	.....	Soapstone Mount.....		16	17
Oceanic.....		17	.....	Southern Pines.....		30	.....
Paterson.....		17	.....	Southport.....		30	.....
Pensauken.....		17	.....	Weldon.....		16	30
Plainfield.....		17	.....	Willeyton.....		16	31
Rancocas.....		30	.....	Wilmington.....		30	.....
Readington.....		17	.....	<i>North Dakota.</i>			
Salem.....		17	28	Berlin.....		23	.....
South Orange.....		17	.....	Bottineau.....		23	.....
Tenady.....		11	.....	Ellendale.....		23	.....
Toms River.....		17	.....	Forman.....		23	.....
Trenton.....		17	30	Fort Buford.....		1	.....
Woodbine.....		17	.....	Fort Yates.....		23	.....
<i>New Mexico.</i>				Grand Forks.....		23	.....
Albuquerque.....		2	.....	Jamestown.....		23	.....
East Las Vegas.....		2	.....	Kelso.....		23	.....
Gallinas Spring.....		2	.....	Milton.....		1	.....
Halls Peak.....		2	.....	Napoleon.....		23	.....
La Luz.....	26	.....	.....	New Salem.....		1	.....
Olio.....	3	.....	.....	Power.....		23	.....
Santa Fe.....	3	.....	.....	Wahpeton.....		23	.....
Socorro.....	3	.....	.....	Washburn.....		1	.....
Sulphur Hot Springs.....		22	.....	Williamsport.....		23	.....
				<i>Ohio.</i>			
				Bangorville.....		16	27

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Ohio—Continued.</i>				<i>Rhode Island.</i>			
Batavia.....		15	28	Kingston.....	16	17	
Bement.....				Lonsdale.....		30	
Bethany.....		16		Narragansett Pier.....	16	17	
Binola.....		29		Providence.....	17	30	
Bissells.....		28		<i>South Carolina.</i>			
Bloomingsburg.....		16		Batesburg.....	16		
Bucyrus.....		29		Blacksburg.....	15	30	
Cadiz.....		31		Blackville.....	31		
Cedarville.....		25		Blenheim.....	15	31	
Celina.....		29		Brewer Mine.....	15		
Cincinnati.....		16		Central.....	15	29	
Clarksville.....		16		Charleston.....	31		
Cleveland.....		17	29	Cheraw.....	15	30	
Colebrook.....		17	29	Columbia.....	29	30	
Columbus.....		28		Connors.....	15	31	
Dayton.....		29		Cross Hill.....	15	31	
Ellsworth.....		30		Darlington.....	29	31	
Elyria.....		17	29	Effingham.....	15	29	
Findlay.....		28		Flint Hill.....	17	31	
Fostoria.....		28		Georgetown.....	31		
Garrettsville.....		2		Greenville.....		15	
Gratiot.....		29		Hardeeville.....	16		
Green Hill.....		28		Hollands Store.....	16	31	
Hanging Rock.....		29		Kingstree.....		31	
Harbor.....		30		Little Mountain.....	15	31	
Hillhouse.....		30		Longshore.....	15	31	
Hillsboro.....		16		Martins.....	15	30	
Hiram.....		28		Pinopolis.....	30	31	
Jacksonboro.....		16		Saint Stephens.....	31		
Leipsic.....		28		Santuck.....	15	30	
Logan.....		29		Simpsonville.....	15	29	
Lordstown.....		16		Statesburg.....	16	31	
Lowell.....		29		Tillers Ferry.....	16	31	
Marion.....		16		Timmonsville.....	30	31	
McConnellsville.....		29		Trenton.....	15	31	
Millfordon.....		29	29	Watts.....	17	31	
Millport.....		27		Yorkville.....	15	30	
Montpelier.....		17	28	<i>South Dakota.</i>			
New Alexandria.....		29		Ashcroft.....			1
Nelsonville.....		28		Bear Valley.....			1
North Lewisburg.....		16		Bowdle.....			23
Orangeville.....		17		Castlewood.....			23
Pataaskala.....		29		Cross.....			1
Pomeroy.....		16	29	De Smet.....			23
Portsmouth.....		31		Faulkton.....			23
Ripley.....		16		Forestburg.....			23
Sandusky.....		16		Forest City.....			23
Sautsville.....		25		Frankfort.....			23
Tiffin.....		28		Gary.....			24
Toledo.....		28		Greenwood.....			28
Upper Sandusky.....		29		Hitchock.....			23
Van Wert.....		29		Hotch City.....			23
Warren.....		28		Huron.....			23
Wayverly.....		16		Kimball.....			28
Waynesville.....		16		Melletta.....			23
Westerville.....		16		Northville.....			23
Weymouth.....		29		Oelrichs.....			25
Youngstown.....		29		Parker.....			31
<i>Oklahoma.</i>				Parkston.....			27
Britton.....	3	26		Pierre.....			1
Burnett.....		15		Rapid City.....			23
Oklahoma.....	2			Spearfish.....			1
Winnview.....	13			Lyndall.....			29
<i>Oregon.</i>				Watertown.....			23
Albany.....	1	23		Webster.....			23
Ashland.....		17		Wessington Springs.....			28
Astoria.....	23			Whitewood.....			1
Aurora.....		23		Yankton.....			28
Bandon.....	25			<i>Tennessee.</i>			
Corvallis.....	14	23		Andersonville.....	15	17	
Forest Grove.....	13	23		Ashwood.....	15	30	
Grants Pass.....	13			Byrdstown.....	16	29	
Hood River.....		23		Hattanooga.....	15	17	
Hubbard.....		21		Clarksville.....	15	29	
Jacksonville.....		17		Covington.....	15	30	
Joseph.....			8	Florence.....	15	29	
Mount Angel.....	17	29		Franklin.....		16	
Newport.....	23			Greenville.....	16	29	
Pendleton.....	12	22	22	Hohenwald.....		15	
Portland.....	1	23		Jackson.....		15	16
Roseburg.....	1			Johnson City.....	23		
Salem.....	14			Knoxville.....	15	29	
Springbrook.....	23			Lynville.....	15	29	
The Dalles.....		23		Memphis.....	15	16	
Toledo.....	22	25		Nashville.....	15	16	
Vernonia.....			31	Newport.....	15	16	
<i>Pennsylvania.</i>				Nunnelly.....		15	
Aqueduct.....			30	Pikeville.....	8	15	
Easton.....	2	17		Riddleton.....	8	21	
Erie.....	2	17	28	Rogersville.....	15	16	
Harrisburg.....	1	17		Rugby.....		15	
Le Roy.....		16	16	Springdale.....		16	
Lock No. 4.....			28	Trenton.....		15	
Mahoning.....		30		Tullahoma.....		15	
Oil City.....		29		Waynesboro.....	15	29	
Philadelphia.....	17	30		Wier.....		16	
Pittsburg.....			29	<i>Texas.</i>			
Quakertown.....		17		Abilene.....		27	
Ridgway.....		29		Arlington.....	13	27	
Stoyestown.....		30		Aurora.....	12		
Wellsboro.....		29		Belton.....	28		
Westtown.....		17	30	Brady.....	3	27	
Wilkesbarre.....		30		Coldwater.....	6	7	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Texas—Continued.				Virginia—Continued.			
Dallas	27			Irwin		30	
Devine	28			Lexington		17	
Eastland	2	25		Lynchburg	16	30	
El Paso	3			Marion		30	
Gainesville	12	26		Nottoway		30	
Graham	13	27		Richmond	16	17	
Grapevine	13	27		Salem	16	29	
Hale City		12		Spottsville	16	17	
Hartley	2	12		Stanardsville		30	
Haskell		26		Staunton		17	
Highland	3	27		Stephens City	2	28	
Longview	15			Woodstock		16	
Mesquite	3	27		Wytheville		16	
Mountain Spring	15	27		Washington.			
Palestine	16			Aberdeen		22	
Paris	15			Anacortes		22	
Roby		26		Blaine		14	31
Silver Falls	15	25		Bridgeport		9	
Sulphur Springs		29		Centerville			31
Utah.				Chelan		21	
Castle Gate			1	Colfax		23	
Heber			12	East Clallam		18	
Moab		5		Fort Canby		23	31
Vermont.				Fort Townsend		19	31
Burlington		19	29	Madrone		23	31
Cornwall		19		Neah Bay		22	
Enosburg Falls		29	29	Oiga	17	23	31
Hartland		29	29	Olympia		23	
Irassburg		29	29	Pine Hill		13	
Jacksonville		15	29	Port Angeles		23	31
Northfield		29	29	Port Crescent			31
Norwich		29	29	Pullman		13	
Stratford		16		Pysh	13	18	31
Vernon		17		Rosalia			10
Wells		11		Seattle	18	23	31
Woodstock		29		Silver Creek			31
Virginia.				Spokane			22
Ashland		16		Tacoma		23	
Avon		30		Tatoosh Island	23		
Bedford City	16	30		Union City		23	
Big Stone Gap	16	29		Vashon		22	31
Birdanest		18		West Ferndale		13	
Blacksburg		17		West Virginia.			
Charlottesville	3	30		Elkhorn		16	
Christiansburg		28		Ella		31	
Dale Enterprise		17		Glenville		31	
Danville	16			Kingwood			28
Falls Church		17		Marlinton	16	17	
Fredericksburg		17		Morgantown			29
Hampton	17			New Martinsville	16	31	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
West Virginia—Cont'd.				Wisconsin—Continued.			
Nuttallburg		29		Green Bay			28
Parkersburg			29	Hayward			14
Pleasant Hill			28	Hillsboro			28
Point Pleasant		31		Koepenick			25
Rowlesburg			29	La Crosse			1
Weston			29	Medford			25
Wheeling			29	Milwaukee		15	
Wisconsin.				Oscola			14
Ashland			24	Stevens Point			28
Belleville			28	Viroqua			28
Butternut			25	Weston			25
City Point			25	Wyoming.			
Columbus			28	Cheyenne			1
Crandon			26	Laramie			11
Estella			24	Saratoga			1
Florence			26	Sheridan			1
Grantsburg			11	Sundance			1

PERIODS OF HIGH TEMPERATURE.

The most interesting period of high temperature is that which includes the 8th to the 12th. During the first of these dates the maximum temperature of the month occurred in the south plateau region, the Southwest, and the central slope. On the 9th it occurred in western Missouri and along the middle and east Atlantic coasts. On the 10th the maxima of the month occurred in Wisconsin and Georgia, on the 11th in Ohio and the central Gulf states, and on the 12th over Lakes Erie and Ontario. There was, therefore, only a very general and indefinite movement of this warm wave eastward in connection with the area of clear weather.

PERIODS OF COLD WEATHER.

The minimum temperatures for the month occurred in Colorado and Wyoming on the 26th, and in Texas and the Southwest on the 27th or 28th. This area of low temperature extended eastward, covering Illinois and the Lake region on the 30th and the entire Atlantic states on the 31st.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for October, 1893, as determined by reports from about 2,000 stations, is exhibited on Chart III. In the table of climatological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The normal precipitation for October is generally less than for September; it is greatest along the north Pacific coast and on the east coast of southern Florida where it exceeds 6. In the Rocky Mountain and plateau regions the precipitation for October is usually less than 1, and diminishes to zero as we go southward to the lower Colorado valley, but increases rapidly as we go northwest into Oregon.

In October, 1893, the monthly precipitation was 4 to 5 on the immediate coast of extreme northern California and of Oregon, and increased toward the north to 8 and 10 in the neighborhood of Tatoosh Island, but diminished rapidly on going eastward from the coast, and was less than 1 for the interior of Washington and eastern Oregon. Little or no precipitation was reported from the interior of California, Nevada, Utah, Arizona, New Mexico, Texas, and Indian Territory, and less than 0.5 from Colorado, Kansas, Nebraska,

western Missouri, and Iowa. The heaviest rainfall occurred on the eastern coast of Florida and the eastern coast of the south Atlantic states.

DEPARTURES FROM NORMAL PRECIPITATION.

Rainfall was in excess of the normal at Titusville, Fla., 3.0; at Mobile, Ala., 5.3; Charleston, S. C., and Savannah, Ga., 3.1; Charlotte, N. C., 4.4; Lynchburg, Va., 4.8; Cairo, Ill., 3.3; and to a less extent at most stations in the central lake region, the Ohio Valley, and the middle and south Atlantic states. Precipitation was also slightly in excess in Montana, Washington, Oregon, and neighboring Canadian stations. A slight deficiency of precipitation was reported from all other regions, the maximum deficit being in Texas, where the departures below the normal were as follows: Abilene, 3.0; Palestine, 3.6; Galveston, 4.4; Corpus Christi, 3.1.

Considered by districts the percentages of monthly precipitation for October, 1893, as compared with the normal for the month, are as follows:

In districts where the precipitation was in excess, the average percentage of the normal was as follows: northern plateau, 166; north Pacific coast, 122; eastern Gulf states, 110; middle Atlantic states, 106; lower lake region, 106; northern slope, 100; Ohio Valley and Tennessee, 93; upper lake region, 88; middle Pacific coast, 88; south Atlantic states, 80; Key West, Fla., 71; New England, 68; extreme northwest, 63; upper Mississippi valley, 55; middle plateau, 47; south